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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,291	12/31/2003	Nicholas P.R. Hill	59377US002	9190

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EXAMINER	
SHAPIRO, LEONID	
ART UNIT	**PAPER NUMBER**
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/20/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/750,291	HILL ET AL.	
	Examiner	Art Unit	
	Leonid Shapiro	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,11,16-30,35-37,39-43,45,46,48 and 50-55* is/are rejected.

7)☒ Claim(s) *7-10,12-15,31-34,38,44,47,49 and 56* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 10-2005, 2-2004
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-6,11,16-30,35-37,39-43,45-46,48,50-54,55 are rejected under 35 U.S.C. 102(b) as being anticipated by Kambara et al. (6,091,406).

As to claim 1, Kambara et al. teaches a touch sensing device (Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

a touch panel (Fig. 5, item 1, Col. 22, Lines 1-10);

a plurality of sensors coupled to the touch panel (Col. 22, Lines 11-18), the plurality of sensors configured to sense bending waves in the touch panel and generate a bending wave signal responsive to the sensed bending waves (from Col. 19 , Line 45 to Col. 20, Line 10);

a transducer coupled to the touch panel and configured to induce bending waves in the touch panel (See Fig. 12, item 32, Col. 34, Lines 10-24); and

a controller coupled to the plurality of sensors (Col. 22, Lines 19-25), the controller configured to identify an untouched condition signal responsive to the induced bending waves, compare the untouched condition signal to the bending wave signal, and detect a touch on the touch panel based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51).

As to claim 2, Kambara et al. teaches the touch panel is substantially rectangular (Col. 22, Lines 1-10); and

the plurality of sensors comprises at least three sensors positioned at comers of the touch panel (Col. 22, Lines 11-18).

As to claim 3-4, Kambara et al. teaches piezoelectric sensor (Col. 22, Lines 11-18) and transducer (Fig. 8, item 32, Col. 23, Lines 2-12).

As to claim 5-6,28-30,41-43 Kambara et al. teaches the transducer is configured to induce bending waves in the touch panel at a single or multiple frequencies (Fig. 25, from Col. 37, Line 59 to Col. 38, Line 8).

As to claim 11,18-19, 24-26,54 Kambara et al. teaches the controller is configured to determine a difference between the bending wave signal and the untouched condition signal and detect the touch and lift off based on the difference (Col. 19, Lines 45-51).

As to claims 16-17,40,52 Kambara et al. teaches the controller is configured to determine the location of the touch and lift off after detecting a touch (/from Col. 18, Line 51 to Col. 19, Line 18).

As to claims 21-23, Kambara et al. teaches the display is LCD, LEDs, CRT (Col. 21, Lines 46-49).

As to claim 20, Kambara et al. teaches a touch system (Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

a touch panel (Fig. 5, item 1, Col. 22, Lines 1-10);

a plurality of sensors coupled to the touch panel (Col. 22, Lines 11-18), the plurality of sensors configured to sense bending waves in the touch panel and generate a bending wave signal responsive to the sensed bending waves (from Col. 19 , Line 45 to Col. 20, Line 10);

a transducer coupled to the touch panel and configured to induce bending waves in the touch panel (See Fig. 12, item 32, Col. 34, Lines 10-24); and

a controller coupled to the plurality of sensors (Col. 22, Lines 19-25), the controller configured to identify an untouched condition signal responsive to the induced bending waves, compare the untouched condition signal to the bending wave signal, and detect a touch on the touch panel based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51).

a display viewable through the touch screen and configured to display information (Fig. 8, item 28, Col. 23, Lines 2-22);

a processor coupled to the display and configured to process information to be displayed on the display (Col. 21, Lines 27-45).

As to claim 27, Kambara et al. teaches a method for determining a touch information (Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

inducing bending waves in a touch panel using a driving signal (See Fig. 12, item 32, Col. 34, Lines 10-24);

generating a bending wave signal responsive to the touch on the touch panel (from Col. 19 , Line 45 to Col. 20, Line 10);

identifying an untouched condition signal responsive to the induced bending waves (Col. 22, Lines 19-25), comparing the untouched condition signal to the bending wave signal, and detecting the touch on the touch panel based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51).

As to claims 35-37,45-46,48 Kambara et al. teaches determining a difference between the bending wave signal and the untouched condition signal; and

detecting the touch based on the comparison comprises detecting the touch if the difference is beyond a threshold value (amplitude or spectrum) Col. 14, Lines 1-15).

As to claim 39, Kambara et al. teaches a method for determining a touch information (Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

inducing bending waves in a touch panel using a driving signal (See Fig. 12, item 32, Col. 34, Lines 10-24);

generating a bending wave signal responsive to the touch on the touch panel (from Col. 19 , Line 45 to Col. 20, Line 10);

identifying an untouched condition signal responsive to the induced bending waves (Col. 22, Lines 19-25), comparing the untouched condition signal to the bending wave signal, and detecting the touch on the touch panel based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51); and

detecting a touch lift off from the touch panel based on the comparison (Col. 20, Lines 2-10).

As to claim 50, Kambara et al. teaches a touch sensing method (Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

detecting a touch on a touch panel by one or more of a plurality of touch detection processes, at least one of the plurality of touch detection processes based on a bending wave induced in the touch panel by a driving signal; and (from Col. 19 , Line 45 to Col. 20, Line 10);

initiating a touch location process after detecting a touch (from Col. 18, line 51 to col. 19, line 17).

As to claim 51, Kambara et al. teaches inducing bending waves in a touch panel using a driving signal (See Fig. 12, item 32, Col. 34, Lines 10-24);

generating a bending wave signal responsive to the touch on the touch panel (from Col. 19 , Line 45 to Col. 20, Line 10);

identifying an untouched condition signal responsive to the induced bending waves (Col. 22, Lines 19-25), comparing the untouched condition signal to the bending wave signal; and detecting the touch on the touch panel based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51).

As to claim 53,55 Kambara et al. teaches a system for determining touch information and lift off information(Col. 17, Lines 61-66, Col. 12, Lines 54-58), comprising:

means for inducing bending waves in a touch panel using a driving signal (See Fig. 12, item 32, Col. 34, Lines 10-24); and

means for generating a bending wave signal responsive to a touch on the touch panel(from Col. 19 , Line 45 to Col. 20, Line 10);

means for identifying an untouched condition signal responsive to the induced bending waves, means for comparing the untouched condition signal to the bending wave signal, and means for detecting the touch panel and touch lift off based on the comparison (from Col. 19, Line 61 to Col. 20, Line 10, Col. 19, Lines 45-51).

Allowable Subject Matter

3. Claims 7-10,12-15,31-34,38,44,47,49,56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Relative to claim 7 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the transducer is configured to induce bending waves in the touch panel at a frequency greater than or equal to half the sampling frequency used by the controller.

Relative to claims 8,31,44 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the transducer is configured to induce bending waves in the touch panel at a frequency associated with an alised untouched condition signal.

Claims 9-10 are dependent on claim 8.

Relative to claim 12 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the controller is configured to determine an amplitude of the untouched condition signal, compare the untouched

condition signal amplitude to an amplitude of the bending wave signal, and detect the touch based on the comparison.

Claim 13 is are dependent on claim 12.

Relative to claim 14 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the controller is configured to determine a spectrum of the untouched condition signal, compare the untouched condition signal to a spectrum of the bending wave signal, and detect the touch based on the comparison.

Relative to claim 15 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the controller is comprised an adaptive filter.

Relative to claim 14 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that the controller is configured to determine a spectrum of the untouched condition signal, compare the untouched condition signal to a spectrum of the bending wave signal, and detect the touch based on the comparison.

Relative to claim 32 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that updating the identified untouched condition signal based on non-touch related conditions.

Claims 33-34 depend on claim 32.

Relative to claims 38,47 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that identifying the untouched

condition signal comprises selecting a plurality of reference filter coefficients of an adaptive filter to cancel the untouched condition signal; comparing the bending wave signal and the untouched condition signal comprises calculating filter coefficients to cancel the bending wave signal and comparing the calculated filter coefficients to the reference filter coefficients; and detecting the touch based on the comparison comprises detecting the touch based on a difference between the calculated filter coefficients and the reference filter coefficients.

Relative to claims 49,56 the major difference between the teaching of the prior art of record (Kambara et al.) and the instant invention is that means for generating a wake on touch signal responsive to the touch; and means for energizing the emitting transducer if the wake on touch signal is generated.

Telephone InquireAny inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Shapiro whose telephone number is 571-272-7683. The examiner can normally be reached on 8 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Hjerpe can be reached on 571-272-7691. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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